IN THE

UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Examiner:	Unknown
Li Wen Chen, et al.		
Serial No.: Unknown	Art Unit:	Unknown
Filed: Herewith		
Title: SYSTEM AND METHOD FOR PROVIDING A DATA WAREHOUSE IN ACCORDANCE WITH A VIRTUAL SCHEMA (as amended)		

BOX PATENT APPLICATION
Commissioner for Patents
Washington, DC 20231

PRELIMINARY AMENDMENT

Sir:

Before examining the above-identified patent application, please amend the application as follows:

IN THE COVER PAGE:

Please replace the name of the law firm on the cover page, lines 32-35, with the following:

--Squire, Sanders & Dempsey L.L.P., 600 Hansen Way, Palo Alto, CA 94304, (650) 856-6500.--

Please replace the address of the Assignee on the cover page, lines 17-18, with the following:

--1257 Tasman Drive, Suite C, Sunnyvale, CA 94089.—

IN THE TITLE:

Please replace the title on the title page, page 1, lines 1-2, and the title on page 29, lines 1-2, with the following title:

--SYSTEM AND METHOD FOR PROVIDING A DATA WAREHOUSE IN ACCORDANCE WITH A VIRTUAL SCHEMA--.

IN THE DRAWINGS

In Figure 5A, for block 407, replace "filter our unnecessary entities" with – filter out unnecessary entities --.

IN THE SPECIFICATION:

On **page 1**, replace the six (6) paragraphs beginning at **line 7** with the following new paragraph:

The present application is a continuation of and claims the benefit of U.S. Patent Application Serial No. 09/306,677, entitled "Method For Providing A Reverse Star Schema Data Model," by Li-Wen Chen and Juan Oritz, filed May 6, 1999, which claims the benefit of U.S. Provisional Patent Application Serial No. 06/116,086, entitled "Method and Apparatus for Performing Customer Data Analysis of a Computer Database Using Reverse Star Schema Data Model," by Li-Wen Chen, filed January 15, 1999. Applications 09/306,677 and 06/116,086 are fully incorporated herein by reference.—

On **page 2**, replace the paragraph beginning at **line 1** with the following new paragraph:

-- Few could foresee the rapid development of computer technology just a few years ago. Computers now have a place in our homes, our offices, our schools and even the our briefcases and satchels. As computer automation continues to impact an ever increasing portion of our daily lives, governments, businesses and individuals have turned to database technology to help them manage the "information explosion" and the exponential proliferation of information that must be sorted, assimilated and managed on a continuing basis. One area of importance to the database design field is data model selection for database applications. --

On page 7, line 9, after **"data warehouse builder,"** insert – 109--.

IN THE CLAIMS:

Please cancel claims 1-34.

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Please add the following new claims 35-103:

1 --35. A method, comprising:

2 receiving a first schema database;

3 forming a virtual schema including at least a portion of a dataset included

4 in the database; and

5 performing data analysis in accordance with the virtual schema.

1 36. A method, comprising:

2 receiving a first schema database;

3 forming a virtual schema including at least a portion of a dataset included

4 in the database; and

5 providing customer centric information to a core of customer data in the

6 database in accordance with the virtual schema.

1 37. A method, comprising:

2 receiving a first schema database;

3 forming a virtual schema including at least a portion of a dataset included

4 in the database; and

5 generating code in accordance with the virtual schema.

1 38. The method of claim 35, wherein

2 the virtual schema comprises a meta model describing relationships

3 between different entities or groups of entities in the data.

1 39. The method of claim 38, wherein the meta model describes a

2 reverse star schema relationship between different entities in the data.

1 40. The method of claim 35, further comprising:

2 creating a report based upon the data analysis.

1 41. A data warehouse builder, comprising:

2 a schema builder that generates one or more virtual schemas including at

3 least a portion of data input from a source, and generates mapping rules controlling data

4 movement into a data warehouse;

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5   a metadata repository operative to hold the virtual schemas and mapping

6   rules; and

7   a code generator that generates one or more analysis functions,

8   wherein the data warehouse is defined by at least a portion of the data

9   input, the virtual schemas, the mapping rules, and the analysis functions.

1   42.   The apparatus of claim 41, wherein

2   the mapping rules govern at least one of consolidating, transforming and

3   formatting the data into the data warehouse.

1   43.   The apparatus of claim 41, wherein

2   the data analysis functions comprise at least one of:

3   static meta data aware customer analysis functions, and

4   dynamically generated customer data analysis functions.

1   44.   The apparatus of claim 43, wherein

2   the meta data aware customer analysis functions are built in functions.

1   45.   The apparatus of claim 41, wherein

2   the metadata repository is operative to hold meta data, and

3   the meta data comprises at least one of:

4   a data schema,

5   a star schema,

6   a virtual schema,

7   a reverse star schema,

8   source data processing rules,

9   source data movement rules,

10   source data loading rules,

11   job schedules for loading or maintaining data flow in the data warehouse,

12 and

13   user provided parameters controlling code generation of data analysis

14 functions.

1   46.   The apparatus of claim 45, wherein

2   the meta data is embedded in code generated by the data warehouse

3   builder.

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1   47.   The apparatus of claim 41, wherein

2   the data warehouse provides information to one or more data analysis

3   applications comprising a front end to the data analysis functions.

1   48.   The apparatus of claim 47, wherein

2   the data analysis applications comprise at least one of:

3   electronic applications,

4   sales force automation applications,

5   customer service applications, and

6   marketing automation applications.

1   49.   The apparatus of claim 47, wherein

2   the data analysis applications comprise customer data analysis

3   applications,

4   the customer data analysis applications include at least one of:

5   decision support analysis relating business decisions to customer behavior,

6   summarizing techniques,

7   applications that analyze data based upon customer identity, and

8   applications that correlate at least one of:

9   customer activities,

10   events,

11   transactions, and

12   status to a customer identity.

1   50.   A system, comprising:

2   a data warehouse;

3   a data warehouse builder;

4   customer data analysis functions; and

5   customer data analysis applications; wherein

6   the data warehouse is defined by the data warehouse builder based upon a

7   reverse star schema.

1   51.   The system of claim 50, wherein

2   the customer data analysis functions comprise:

3   static meta data aware customer analysis functions; and

4   dynamically generated customer data analysis functions.

1   52.   An apparatus, comprising:

2   means for generating one or more virtual schemas including at least a

3   portion of data input from a source;

4   means for generating mapping rules controlling data movement into a data

5   warehouse;

6   means for holding the virtual schemas and mapping rules; and

7   means for generating one or more analysis functions based upon the virtual

8   schemas and data input.

1   53.   A computer readable storage device having stored thereon data in

2   accordance with a data model, the data model comprising:

3   a focal group, comprising:

4   at least one of a plurality of core components; and

5   at least one of a plurality of classification components providing

6   classifications for information relating to the core components; and

7   at least one customized group, comprising:

8   at least one of a plurality of customer activity components related

9   to the core component; and

10   at least one of a plurality of activity lookup components related to

11   at least one of the customer activity components;

12   wherein the focal group and the customized group comprise a reverse star

13   schema meta model.

1   54.   The computer readable storage device of claim 53, wherein

2   the focal group comprises components, including components that

3   describe at least one of:

4   customer characteristics,

5   profiles,

6   business related classifications,

7   customer's roles, and

8   definitions,

9   wherein the components are in different business functional areas.

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55. The computer readable storage device of claim 53, wherein the core components further comprises at least one of:

customer entity, and

related customer identity information.

56. The computer readable storage device of claim 55, wherein the customer identity information further comprises at least one of:

an account identifier,

social security number, and

encrypted name.

57. The computer readable storage device of claim 53; wherein the classification components relate to at least one of:

a business, and

a customer.

58. The computer readable storage device of claim 57, wherein the classification components further comprise at least one of:

business profile,

demographics,

current profile,

region,

channel, and

sales organization.

59. The computer readable storage device of claim 58, wherein a relationship exists between at least one of the classification components and a customer entity within the core components.

60. The computer readable storage device of claim 53, wherein the customized group relates to operational business transactions.

61. The computer readable storage device of claim 60, wherein the customized group further comprise at least one of:

business measures, and

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4   attributes,

5   wherein the business measures and attributes describe event transactions.

1   62.   The computer readable storage device of claim 61, wherein

2   the event transactions further comprise at least one of:

3   independent events, and

4   dependent events.

1   63.   The computer readable storage device of claim 62, wherein

2   a sequence comprising two or more event transactions is used to describer

3 various stages of customer activity.

1   64.   The computer readable storage device of claim 63, wherein

2   the sequence of event transactions comprises two or more of:

3   subscription,

4   payment,

5   promotion,

6   price plan change,

7   service call, and

8   cancellation.

1   65.   The computer readable storage device of claim 53, wherein

2   the customer activity components relate to at least one of:

3   event transactions, and

4   measures,

5   wherein the event transactions and measures relate to customer activities.

1   66.   The computer readable storage device of claim 53, wherein

2   the customer activity components further comprise:

3   at least one of a plurality of attributes.

1   67.   The computer readable storage device of claim 66, wherein

2   the at least one of a plurality of attributes includes a selection from among

3 a list of built-in attributes.

1   68.   The computer readable storage device of claim 67, wherein

2   the at least one of a plurality of attributes further comprises:

3   user-defined attributes.

1   69.   The computer readable storage device of claim 68, wherein

2   the at least one of a plurality activity lookup components comprises:

3   detail characteristics of customer event transactions.

1   70.   The computer readable storage device of claim 68, wherein

2   the at least one of a plurality activity lookup components comprises:

3   a products entity.

1   71.   The computer readable storage device of claim 53, wherein

2   the at least one of a plurality of core components comprises:

3   a customer entity, and

4   at least one of a plurality of account entities,

5   wherein the customer entity and the account entities provide

6   account level concepts to queries relating to customers.

1   72.   A method for creating a customer centric data warehouse, the

2   method comprising:

3   providing a template schema;

4   receiving a first input of characteristics;

5   applying the first input of characteristics to the template schema to

6   produce a logical schema;

7   receiving a second input of characteristics;

8   applying the second input of characteristics to the logical schema to

9   produce a physical schema; and

10   moving data to create the customer centric data warehouse in accordance

11   with the physical schema.

1   73.   The method of claim 72, wherein:

2   applying the first input of characteristics to the template schema to

3   produce a logical schema, comprises:

4   selecting a business model to filter out unnecessary entities;

5   selecting business entities related to customers in a focal group of the

6   template schema; and

7   selecting and defining customer transactions and/or event entities and

8 attributes in a customized group of the template schema.

1   74. The method of claim 73, wherein:

2   applying the first input of characteristics to the template schema to

3 produce a logical schema, further comprises:

4   selecting source data tables and/or attributes.

1   75. The method of claim 72, wherein:

2   applying the second input of characteristics to the logical schema to

3 produce a physical schema, comprises:

4   defining customer event types in customer activity components; and

5   determining data types and primary and/or foreign keys.

1   76. The method of claim 75, wherein:

2   applying the first input of characteristics to the template schema to

3 produce a logical schema, further comprises:

4   determining data types based upon source data.

1   77. The method of claim 72, wherein:

2   moving data to create the customer centric data warehouse in accordance

3 with the physical schema, further comprises:

4   providing meta data comprising mapping rules that describe how data from

5 external sources is mapped to data table and attributes in the data warehouse.

1   78. The method of claim 77, wherein:

2   the mapping rules further comprise a plurality of transformation rules.

1   79. A method, comprising:

2   selecting a business model template;

3   selecting customer entities from a plurality of defined customer entities in

4 a focal group;

5   defining customer transactions and event entities and attributes;

6   defining customer activity components in customer activity components;

7   selecting source data and attributes;

8   determining data types based on source data;

9   determining data types and primary/foreign keys;

10   creating a database; and

11   creating data movement mapping rules.

1   80.   The method of claim 79, wherein:

2   selecting customer entities from a plurality of defined customer entities in

3   a focal group comprises selecting the customer entities based upon fit to a need

4   determinable from one or more business processes.

1   81.   The method of claim 79, wherein:

2   selecting source data tables and attributes comprises selecting the

3   attributes from at least one of a list of pre-defined attributes and user defined attributes.

1   82.   The method of claim 79, wherein:

2   selecting source data tables and attributes comprises accessing information

3   about entities in customer activity components through a plurality of definable activity

4   lookup components.

1   83.   The method of claim 82, wherein:

2   the entities in customer activity components comprises business

3   transactions, and

4   the information comprises at least one of products, stores, purchasers, and

5   payment paradigms.

1   84.   The method of claim 79, wherein:

2   defining customer activity components comprises using transaction types

3   as domain constraints when the data warehouse is created.

1   85.   The method of claim 79, wherein:

2   defining customer activity components comprises using event transaction

3   types as attribute values for customer event correlation queries in customer data analysis.

1   86.   The method of claim 79, wherein:

2   selecting source data and attributes comprises providing user browsing

3   through a data model to select data tables and attributes to comprise a source of data

4   tables and attributes of a data warehouse.

1   87.   The method of claim 79, wherein:

2   determining data types based on source data comprises providing

3   automated derivation of data types.

1   88.   The method of claim 87, wherein:

2   determining data types based on source data comprises providing user

3   capability to change the data types provided by the automated derivation of data types.

1   89.   The method of claim 79, wherein:

2   determining data types and primary/foreign keys using a database design

3   tool, ERWin.

1   90.   The method of claim 79, wherein:

2   creating a database comprises using a data warehouse builder to construct

3   a data warehouse based upon database configuration information provided by a user.

1   91.   The method of claim 79, wherein:

2   creating data movement mapping rules comprises using a database design

3   tool, EXTRACT.

1   92.   A user interface method, comprising:

2   providing a hierarchical display of functional components;

3   highlighting a first component in the hierarchical display, indicating a

4   component to be defined; and

5   receiving input indicating information to be incorporated into the

6   component to be defined.

1   93.   The method of claim 92, further comprising:

2   displaying a business model dialog whenever a reverse star schema

3   component is highlighted and selected, wherein

4   the business model dialog comprises:

5   a business model field; and

6   a business characteristics field.

1   94.   The method of claim 93, further comprising:

2   displaying a database creation dialog whenever information is entered into

3   the business model dialog, wherein

4   the database creation dialog comprises:

5   a database name field;

6   a database files field; and

7   a file properties area.

1   95.   The method of claim 94, further comprising:

2   displaying a transaction log whenever a transaction log tab is selected,

3   wherein

4   the transaction log comprises:

5   a database files field; and

6   a file properties area.

1   96.   The method of claim 95, further comprising:

2   displaying a reverse star schema customization dialog whenever

3   information is entered into the database creation dialog, wherein

4   the reverse star schema customization dialog comprises:

5   a display of a focal group;

6   a display of at least one of a plurality of tables related to the focal group;

7   and

8   a mechanism for receiving inputs of information to perform at least one of

9   create, edit, plan layout, identify sources of data and specify data transformations for the

10   tables.

1   97.   A computer program product, comprising:

2   code for accessing meta data from a repository;

3   code for translating entities from a meta model into a data schema to form

4   a database;

5   code for providing customer activity correlation queries with access to a

6   database of a data warehouse;

7   code for providing customer data analysis functions;

8   code for providing analysis results to at least one of a plurality of business

9   applications; and

10   a computer readable storage medium for holding the codes.

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1   98.   The computer program product of claim 97, wherein

2   the code for providing customer data analysis functions comprises:

3   code that provides at least one of a market basket analysis and customer

4   valuation analysis.

1   99.   A computer program product, comprising:

2   code for providing a user interface;

3   code for generating customer data analysis function code;

4   code for scheduling tasks for managing a data warehouse;

5   code for pre-processing data for movement into the data warehouse;

6   code for managing creation of the data warehouse;

7   code for defining customer data analysis functions;

8   code for performing data source analysis;

9   code for planning operations of a customer data analysis environment; and

10   a computer readable storage medium for holding the codes.

1   100.   The computer program product of claim 99, wherein

2   customer data analysis function code is generated from stored meta data.

1   101.   The computer program product of claim 99, wherein

2   customer data analysis function code is generated based upon built in

3   function code templates.

1   102.   A customer data analysis report produced according to the method

2   of claim 1.

1   103.   A method, comprising:

2   providing a focal group, comprising:

3   at least one of a plurality of core components; and

4   at least one of a plurality of classification components providing

5   classifications for information relating to the core components; and

6   providing at least one customized group, comprising:

7   at least one of a plurality of customer activity components related

8   to the core component; and

9   at least one of a plurality of activity lookup components related to

10   at least one of the customer activity components;

11   wherein the focal group and the customized group comprise a reverse star

12   schema meta model.

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REMARKS

The present application is a continuation of Serial No. 09/306,677 and contains the original disclosure as filed in the patent application entitled, "Method For Providing A Reverse Star Schema Data Model", filed on May 6, 1999, by inventors Li-Wen Chen and Juan Oritz.

Claims 1-34 have been cancelled. Claims 35-103 have been added. Consideration of these new claims is respectfully requested. No new matter is being added by this preliminary amendment.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE**".

If the Examiner has any questions or needs any additional information, the Examiner is invited to telephone the undersigned attorney at (650) 843-8791.

If for any reason an insufficient fee has been paid, the Commissioner is hereby authorized to charge the insufficiency to Deposit Account No. **05-0150**.

Date: 11/29/01
Squire, Sanders & Dempsey L.L.P.
600 Hansen Way
Palo Alto, CA 94304-1043
Telephone (650) 856-6500
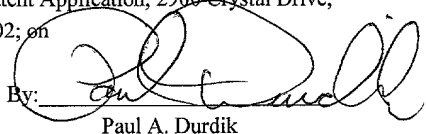Facsimile (650) 843-8777

Respectfully submitted,

Paul A. Durdik
Attorney for Applicants
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CERTIFICATE OF EXPRESS MAILING

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as EXPRESS MAIL LABEL **EL 701 363 527 U.S.** in an envelope addressed to the Commissioner for Patents and Trademarks, Box Patent Application, 2900 Crystal Drive, Arlington, VA 22202; on

Date: 11/29/2001 By: Paul A. Durdik

In re: *Li Wen Chen, et al.*   28569

Version With Markings To Show Changes Made

IN THE TITLE:

    Please replace the title on the title page, page 1, lines 1-2, and the title on page 29, lines 1-2, with the following title:

--<u>SYSTEM AND</u> METHOD FOR PROVIDING A <u>DATA WAREHOUSE IN</u> <u>ACCORDANCE WITH A VIRTUAL</u> [REVERSE STAR] SCHEMA[DATA MODEL]--

IN THE SPECIFICATION:

    The six (6) paragraphs beginning at **line 7 of page 1** have been amended as follows:

    -- [This application claims priority from the following U.S. Provisional Patent Applicationk the disclosure of which, including all appendices and all attached documents, is incorporated by reference in its entirety for all purposes:

    U.S. Provisional Patent Application Serial No. 06/116,086 Li-Wen Chen, entitled "Method and Apparatus for Performing Customer Data Analysis of a Computer Database Using Reverse Star Schema Data Model," (Attorney Docket Number 19608-000100US), filed January 15, 1999

    The following commonly-owned co-pending applications, including this one, are being filed concurrently and the others are hereby incorporated by reference in their entirety for all purposes:

    1. U.S. Patent Application Serial No. _____, Li-Wen Chen and Juan Oritz entitled, "METHOD FOR PROVIDING A REVERSE STAR SCHEMA DATA MODEL," (Attorney Docket Number 19608-000100US 52719.00002);

    2. U.S. Patent Application Serial No. _____, Li-Wen Chen entitled, "APPARATUS FOR PROVIDING A REVERSE STAR SCHEMA DATA MODEL," (Attorney Docket Number 19608-000120US); and

    3. US Patent Application Serial No. _____, Li-Wen Chen entitled, "SYSTEM FOR PROVIDING A REVERSE STAR SCHEMA DATA MODEL," (Attorney Docket Number 19608-000130US).]

    <u>The present application is a continuation of and claims the benefit of U.S. Patent</u> <u>Application Serial No. 09/306,677, entitled "Method For Providing A Reverse Star</u>

Schema Data Model," by Li-Wen Chen and Juan Oritz, filed May 6, 1999, which claims

the benefit of U.S. Provisional Patent Application Serial No. 06/116,086, entitled

"Method and Apparatus for Performing Customer Data Analysis of a Computer Database

Using Reverse Star Schema Data Model," by Li-Wen Chen, filed January 15, 1999.

Applications 09/306,677 and 06/116,086 are fully incorporated herein by reference.—

The paragraph beginning at **line 1 of page 2** has been amended as follows:

-- Few could foresee the rapid development of computer technology just a few

years ago. Computers now have a place in our homes, our offices, our schools and even

the our briefcases and satchels. As computer automation continues to impact an ever

increasing portion of our daily lives, governments, businesses and individuals have

turned to database technology to help them manage the "information explosion[,]" and

the exponential proliferation of information that must be sorted, assimilated and managed

on a continuing basis. One area of importance to the database design field is data model

selection for database applications. –